

Southern Trinity Groundwater Conservation District

Groundwater Management Plan

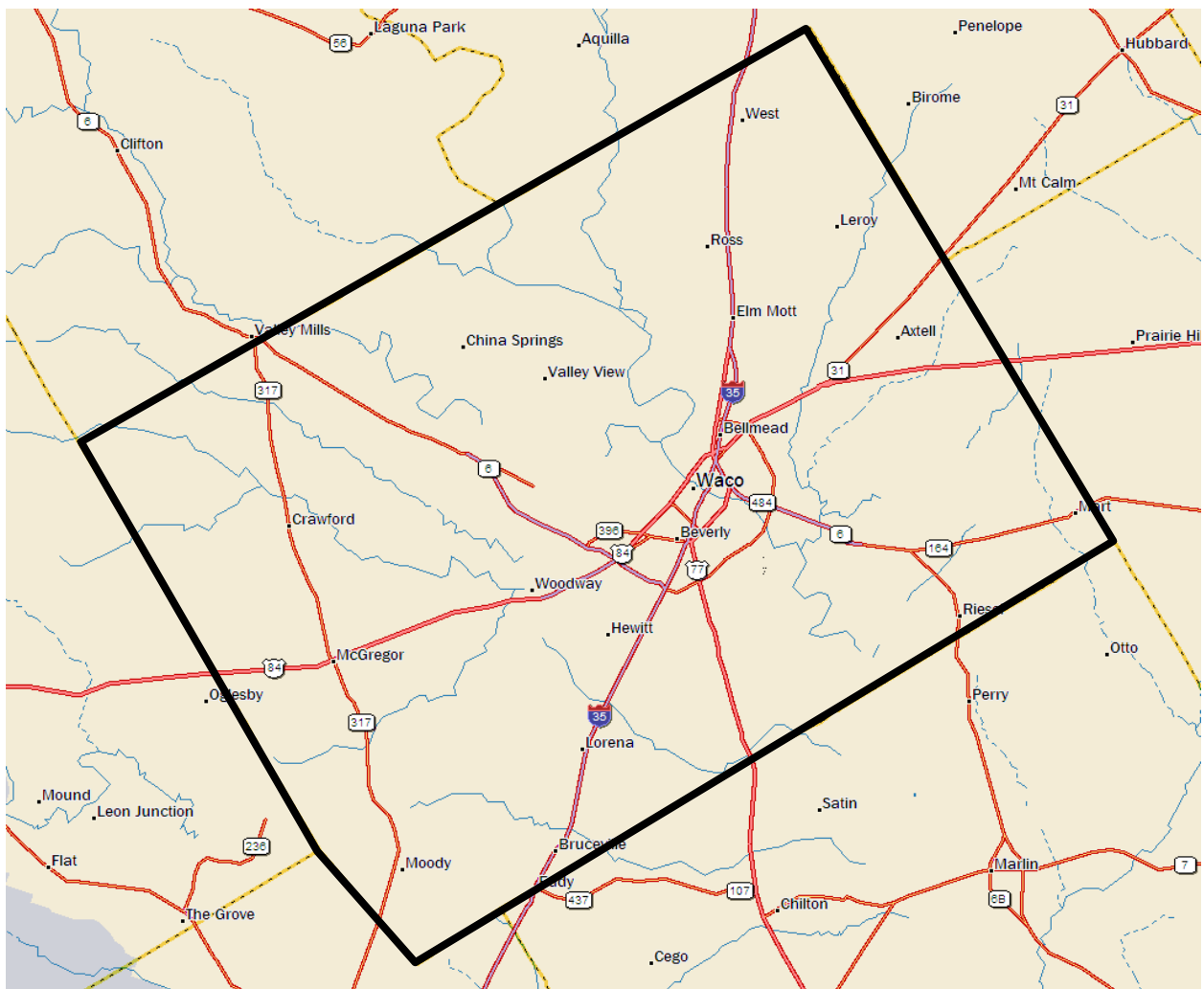


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1. Introduction

This plan will become effective upon adoption by the District's Board of Directors and approval as administratively complete by the Texas Water Development Board. The plan will remain in effect for five (5) years after the date of approval unless amended or replaced sooner.

1.1. Background and Purpose

The District was created by legislation in the 80th Texas Legislature in 2007 (SB1985), and amended by the 81st Texas Legislature in 2009 (SB2513) and by the 82nd Texas Legislature in 2011 (HB801). The purpose of the District is to conserve, preserve, protect, recharge and prevent the waste of groundwater and to control subsidence caused by groundwater withdrawals, consistent with Section 59, Article XVI, Texas Constitution and Chapter 36, Texas Water Code.

1.2. Groundwater Resources

The District has within its boundaries the Trinity, the Woodbine, and the Brazos River Alluvium aquifers. The following paragraphs describe the aquifers and their approximate locations within the District. The relationship to confining units and other groundwater resources within the District are also discussed. Appendix 10.1 contains a chart of showing the geological cross-section passing through the District from Northwest to Southwest. This cross-section shows the out crop and recharge area of the Trinity Aquifer.

1.2.1. Trinity Aquifer

The Trinity Aquifer is located throughout McLennan County as a confined aquifer. Its recharge area occurs outside the District to the north and west. There are a number of named, geologic formations that, collectively, are considered to comprise the Trinity Aquifer. To the west of McLennan County, the aquifer is designated the Twin Mountains formation where the sands crop out on the surface and receive recharge from precipitation. To the north where the Glen Rose formation is absent, the Trinity Aquifer is called the Antlers formation and to the south it is designated the Travis Peak. The portion of the Trinity Aquifer within the District has three water bearing strata: the Paluxy, the Hensell and the Hosston. The aquifer dips to the southeast becoming deeper below the surface in the eastern part of the district. The increase in depth to the southeast is accentuated by the Balcones Fault Zone, which consists primarily of normal faults downthrown to the southeast. As the aquifer dips to the southeast the Hensell and Hosston become divided by several formations including the Pearsall, Cow Creek, Hammett and Sligo.

The Paluxy, Glen Rose, Pearsall, Cow Creek, Hammett and Sligo formations are not major contributors to aquifer production but they are included with the Hensell and Hosston formations as the Trinity Aquifer in the District. The Paluxy formation only occurs in the western part of the District. The outcrop of the Paluxy occurs outside of the District boundaries to the north and west. There is very little or no use of groundwater in the portion of Paluxy within McLennan County.

1.2.2.1 Management Zones

Figure 1.1 below shows the geographic location of the Hensell Management Zone (Hensell MZ) and Figure 1.2 shows the geographic location of the Hosston Management Zone (Hosston MZ). Permitted groundwater wells located in the Hensell MZ predominately withdraw groundwater from the Hensell (upper) stratum of the Trinity Aquifer and wells located in the Hosston MZ predominate withdraw groundwater from the Hosston (lower) stratum of the Trinity Aquifer. Some wells in both management zones may withdraw water from both the upper and lower strata.

The District groundwater level monitoring program has shown that the annual rate of decline in for wells located in the Hensell MZ is greater than that in the Hosston MZ and that management of each the aquifers may require different limitations on the amount of annual production allowed from each respective stratum.

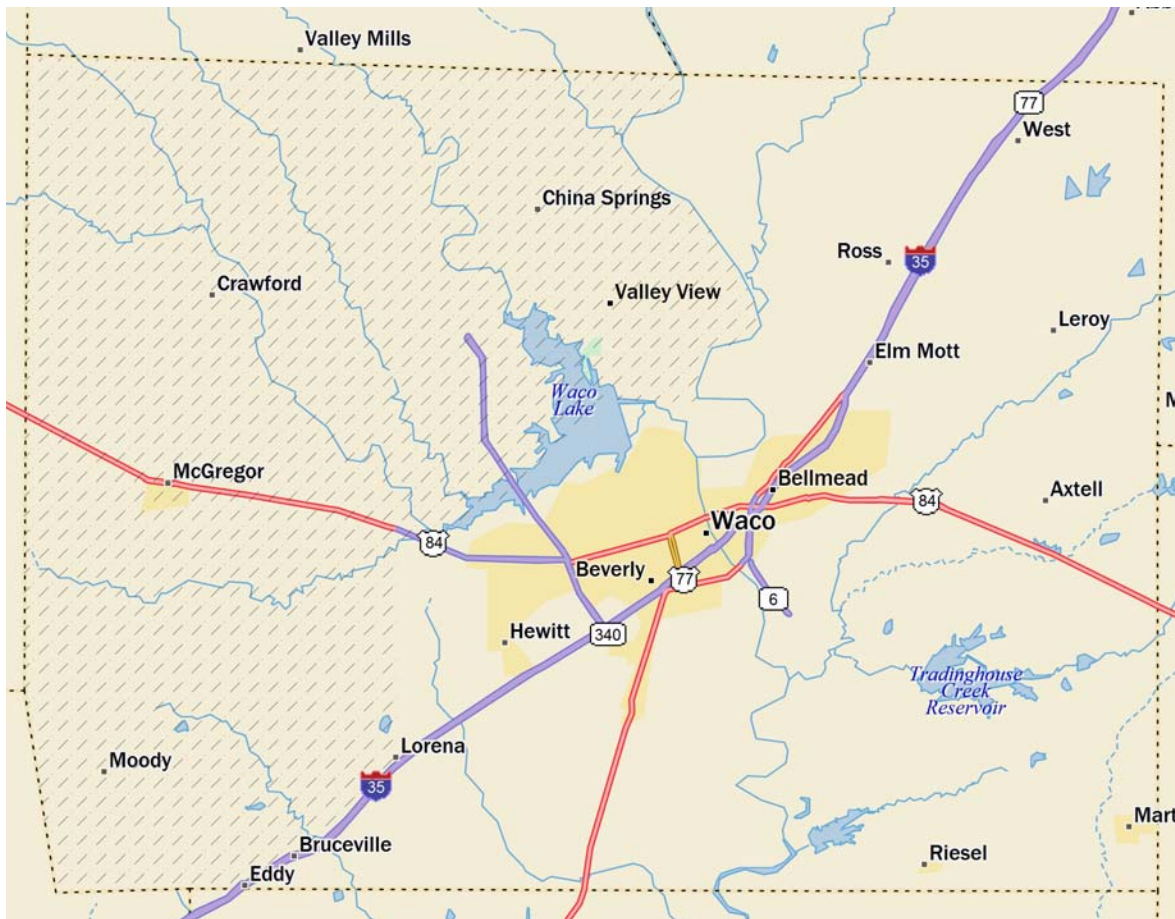


Figure 1.1 Geographic Extent of Hensell Management Zone (shown as hatched area)

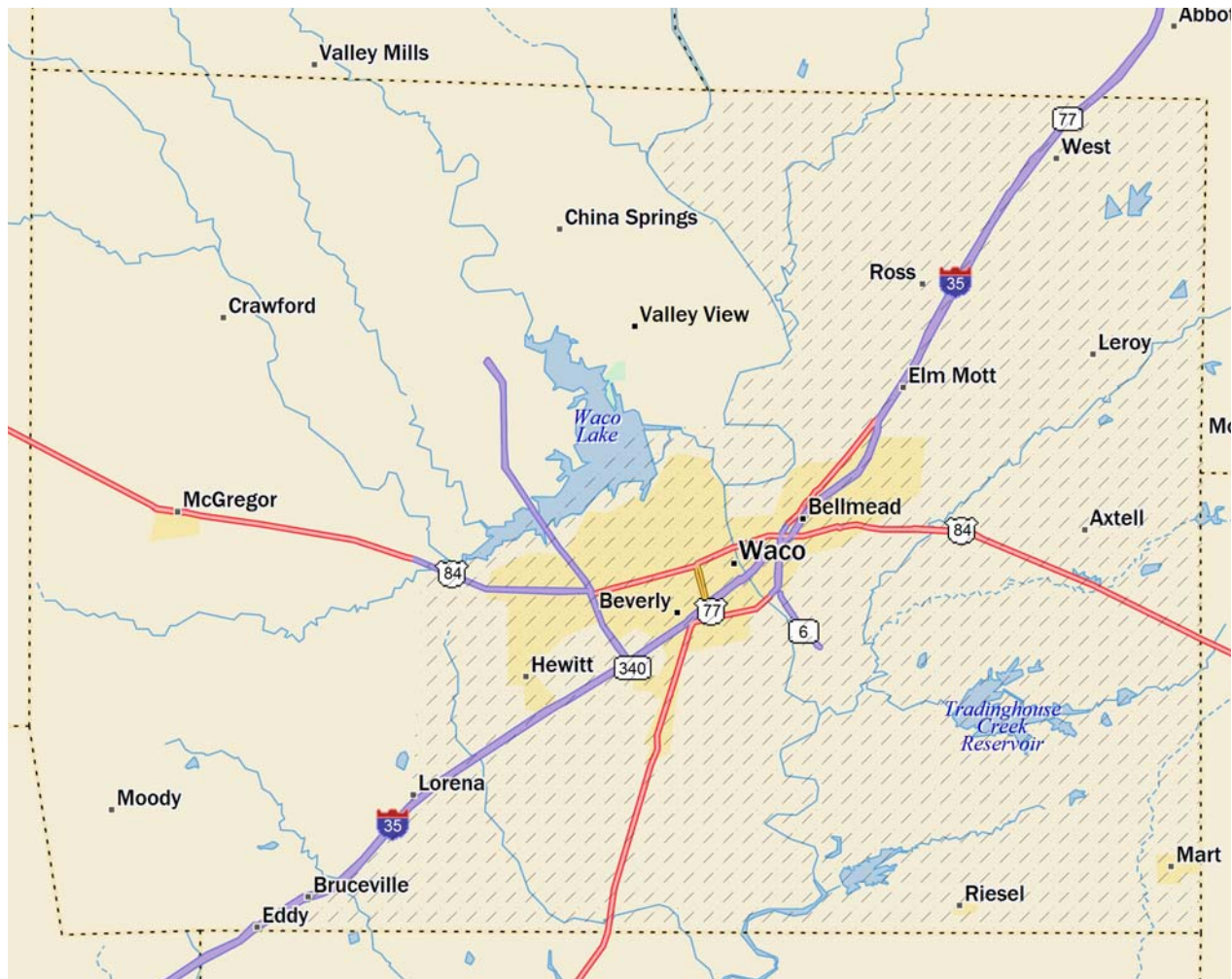


Figure 1.2 Geographic Extent of Hosston Management Zone (shown as hatched area)

1.2.2. Brazos River Alluvium Aquifer

The Brazos River Alluvium Aquifer consists of water bearing alluvial sediments that occur in floodplain and terrace deposits proximate to the Brazos River as it flows through McLennan County. The Brazos River Alluvium Aquifer is an unconfined aquifer that receives recharge primarily from direct precipitation on the floodplain surface but may also be recharged from overbank flows during flood events and from lateral flow from adjacent formations. The aquifer discharges through springs and seeps into the Brazos River and streams within the outcrop of the alluvium.

1.2.3. Woodbine Aquifer

The Woodbine Aquifer is a minor aquifer that extends only into a very limited portion of the northernmost part of McLennan County. The outcrop of the Woodbine occurs within the District boundaries but is covered by alluvium over much of its area. There is no or very little use of the

groundwater in the portion of the Woodbine Aquifer within McLennan County. The District's Board has designated the Woodbine Aquifer as non-relevant for regional planning purposes.

1.2.4. Other Groundwater Resources

Shallow or perched groundwater occurs in the fractured weathered veneer of the Fredericksburg and Washita series and in other formations in McLennan County. Little water is produced from this shallow or perched groundwater in McLennan County but it supports small springs and local stream base flow.

1.3. Texas Water Development Board - Groundwater Availability Model (GAM)

The Trinity and Woodbine aquifers are included in a TWDB GAM model (Bené *et al*, 2004). The Northern Trinity/Woodbine Aquifer GAM is a 7-layer model that has the ability to resolve inflow and vertical movement of water between layers. This model was used as a reference for estimating recharge from precipitation, the amount of flow into and out of the district, and the amount of inflow from overlying or underlying units. The model does not include the Brazos River Alluvium Aquifer. A newer GAM Model has been approved by the TWDB, but at the time this plan was prepared the Groundwater Management Area 8 (GMA 8) had not adopted any new MAG or DFC values.

1.4. Priority Groundwater Management Area

The Texas Commission on Environmental Quality designated portions of the Trinity Aquifer, including that portion within the District, as a priority groundwater management area (Appendix 10.3). This TCEQ finding indicates that the decline in groundwater levels in the Central Trinity Aquifer is a significant problem and that the decline in groundwater levels will cause groundwater availability and quality problems for the region.

2. Groundwater Management

The District has adopted rules to regulate groundwater withdrawals, primarily by means of well spacing and production limits (Appendix 10.17). The District will make periodic assessments of groundwater conditions within the District and will report those conditions to the Board. The District will undertake investigations and, to the extent appropriate, cooperate with third-party investigations, of the groundwater resources within the District, and the results of the investigations will be made available to the public.

The District has adopted rules designed to achieve the desired future conditions (DFCs) for the groundwater resources within the District, as those DFCs are agreed upon by Groundwater Management Area 8 (GMA 8). With respect to the Trinity, Woodbine, and Brazos River Alluvium aquifers, the District will adopt an historic use period and provide preferential permitting rights to those well owners that can demonstrate beneficial and non-wasteful groundwater usage during that period. A similar approach might be adopted for other groundwater sources within the District as well. The District may, at the Board's discretion after notice and hearing, amend or revoke any permit for non-compliance, or reduce the production authorized by permit for the purpose of protecting the aquifer and groundwater

availability. The District will enforce the terms and conditions of permits and the rules of the District as authorized by Chapter 36 of the Texas Water Code.

The District will employ reasonable technical resources within its budgetary constraints to evaluate the groundwater resources within the District and to determine the effectiveness of regulatory or conservation measures.

The District will establish and enforce rules that require, among other things, the following:

1. spacing requirements for certain non-exempt groundwater wells;
2. permits limiting the annual amount of groundwater that can be produced from non-exempt wells;
3. a limit on the maximum amount of groundwater permitted for withdrawal from the Hensell (upper) stratum of the Trinity Aquifer within the District;
4. a limit on the maximum amount of groundwater permitted for withdrawal from the Hosston (lower) stratum of the Trinity Aquifer within the District; and
5. a limit on the maximum amount of groundwater permitted for withdrawal from the Brazos River Alluvium Aquifer within the District.

3. Estimates of Annual Volumes of Water

The estimates of annual volumes of water discussed in this section were obtained from a report prepared by the Texas Water Development Board (TWDB GAM Run 14-015 Report). A copy of this report is included in Appendix 10.2. This report contains estimates of the annual amount of recharge from precipitation, annual volumes of water that discharge from aquifers to springs, annual volumes of groundwater inflow and outflow to and from aquifers and volume of flow between aquifers. All values reflect estimated groundwater flow with respect to the District's boundaries. Appendix 10.4 contains a copy of a Technical Memorandum regarding "The Brazos River Alluvium Aquifer Flow System in McLennan County, Texas" and contains estimates of the annual amount of recharge from precipitation, annual volumes of water that discharges from aquifers to springs, and annual volumes of interflow and outflow from aquifers within the Brazos River Alluvium Aquifer.

3.1. Estimate of the Annual Volume of Water That Discharges from the Aquifers to Springs and Any Surface Water Bodies, Including Lakes, Streams and Rivers, 31 TAC §356.5(a)(5)(D), TWC §36.1071(e)(3)(D)

3.1.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston strata)

The estimate for discharges from the Trinity Aquifer to springs or surface water bodies is zero (Table 2 in Appendix 10.2).

3.1.2. Brazos River Alluvium Aquifer

The estimate of discharge from the Brazos River Alluvium Aquifer to the Brazos River to springs or surface water bodies is 2,500 acre-feet per year in McLennan County (Yelderma, 2008, Appendix 10.4, Page 10-29).

3.1.3. Woodbine Aquifer

The estimate of the total annual volume of water that discharges from the Woodbine Aquifer to springs or surface water bodies is 1,370 acre-feet. No discussion was provided in the report regarding the location of the discharge but it is likely much of the discharge is to seeps along the sides and beds of streams (Table 1 in Appendix 10.2).

3.1.4. All other Aquifers, Formations, or Series

The estimate of the total annual volume of water that discharges from all other aquifers, formations, or series is zero.

3.2. *Estimate of the Modeled Available Groundwater in the District Based On The Desired Future Condition of the Aquifers, 31 TAC §356.5(a)(5)(A); TWC §36.1071(e)(3)(A)*

3.2.1. Trinity Aquifer (Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

Modeled Available Groundwater for the portion of the Trinity Aquifer within the District has been determined by the Texas Water Development Board to be 20,690 acre-feet per year (Appendix 10.5).

3.2.2. Brazos River Alluvium Aquifer

Modeled Available Groundwater for the portion of the Brazos River Alluvium Aquifer within the District has been determined by the Texas Water Development Board to be 15,023 acre-feet per year (Appendix 10.6).

3.2.3. Woodbine Aquifer

Modeled Available Groundwater for the portion of the Woodbine Aquifer within the District has been determined by the Texas Water Development Board to be 5 acre-feet per year (Appendix 10.7)

3.3. *Estimate of The Amount of Groundwater Being Used Within The District On An Annual Basis, 31 TAC §356.5(a)(5)(B); TWC §36.1071(e)(3)(B)*

Comprehensive groundwater production and consumption data for McLennan County have been accumulated and reported since February 2008 to the District. The District has worked each year since 2008 to improve the accuracy and completeness of the metering reports and amount of annual

groundwater produced in the District. Appendix 10.8 contains records for production for the years 2010 through 2014. The production amounts for 2011 is estimated due to reporting problems during that year, and the years 2012 through 2014 rates are rated by the District as very accurate. Appendix 10.9 contains a report evaluating the amount of agricultural land that was irrigated in 2013 in the District (both surface water and groundwater) and was used to verify the amount of groundwater production reported to the District for agricultural use. Appendix 10.11 contains a table of the Estimated Historical Water Use prepared by the TWDB showing groundwater use in McLennan County for 2010 as 17,045 acre-feet and in 2011 as 23,225¹ acre-feet.

3.3.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

The best available data regarding groundwater use from the Trinity Aquifer within the District comes from reports to the Southern Trinity Groundwater Conservation District in the year 2008 of the amount of groundwater pumped by non-exempt well owners. The District rules have required reporting the amount of groundwater produced from all non-exempt wells drilled into the Trinity Aquifer, in McLennan County. Exempt production from the Trinity Aquifer is estimated at 200 acre-feet per year. The total amount reported of groundwater pumpage from the well screened in the Trinity is 16,983, 16,154², 15,325, 13,836, and 12,410 acre-feet per year for 2010 through 2014, respectively (Appendix 10.8).

3.3.2. Brazos River Alluvium Aquifer

The amount of production reported for 2014 for permitted wells was 18 acre-feet. The total estimate of production including exempt wells is estimated to be 100 acre-feet per year for every year from 2010 through 2014.

3.3.3. Woodbine Aquifer

There are no known non-exempt wells located in the portion of the Woodbine Aquifer within the District. The exempt-use, if any, is likely less than 5 acre-feet per year.

3.3.4. All Other Aquifers and Geological Formations or Series

There is no estimate of the amount of groundwater being used within the District on an annual basis for any other aquifers or geological formations or series.

¹ The District estimates that the 2011 groundwater production was approximately 16,154 acre-feet per year. This estimate is consistent with the ongoing efforts of the District and water users to utilize more surface water.

² The District's water use records for 2011 were incomplete and the 2011 production value was estimated based on an average of 2010 and 2012 numbers.

3.4. *Estimate of the Annual Amount of Recharge, From Precipitation, To The Groundwater Resources Within The District, 31 TAC §356.5(a)(5)(C); TWC §36.1071(e)(3)(C)*

3.4.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

There is no known recharge from precipitation to the Trinity Aquifer (Paluxy Aquifer, Glen Rose Formation, Hensell Aquifer, Pearsall/Cow Creek/Hammett/Sligo Formations and Hosston Aquifer) within the District.

3.4.2. Brazos River Alluvium Aquifer

Recharge from precipitation to the Brazos River Alluvium Aquifer is estimated to be 11,000 acre-feet per year within the District (Appendix 10.4).

3.4.3. Woodbine Aquifer

The estimate of annual recharge from precipitation to the Woodbine Aquifer within the District is 370 acre-feet (Appendix 10.2).

3.4.4. All Other Aquifers, Formations, or Series

There are no recharge estimates available from precipitation to all other aquifers, formations, or series within the District.

3.5. *Estimate of the Annual Volume of Flow Into and Out of the District Within Each Aquifer, and Between Aquifers, In the District, 31 TAC §356.5(a)(5)(E); TWC §36.1071(e)(3)(E)*³

3.5.1. Trinity Aquifer

The estimated annual volume of flow into the District for the Trinity Aquifer is 12,514 acre-feet. The estimated annual volume of flow out of the District for the Trinity Aquifer is 1,251 acre-feet. The estimate of the annual volume of flow from overlying confining units to the Trinity Hensell Aquifer is 534 acre-feet (Appendix 10.2).

³ All estimates of annual volumes of flow, except for the Brazos River Alluvium Aquifer, where obtained from Texas Water Development Board GAM Run 14-015 which is included in Appendix 10.2. Estimates of annual volumes of flow for the Brazos River Alluvium Aquifer where obtained from Technical Memorandum by Yelderman, 2008 of which a copy is included in Appendix 10.4 or through personal communication with Yelderman.

3.5.2. Brazos River Alluvium Aquifer

Estimated annual volume of flow into the District for the Brazos River Alluvium Aquifer is 340 acre-feet per year. Estimated annual volume of flow out of the District for the Brazos River Alluvium Aquifer is 360 acre-feet per year (Yelderman, 2008). The Brazos River Alluvium Aquifer is a water table aquifer and has no overlying aquifer. It is underlain in McLennan County by slowly permeable aquitards and therefore there is no measurable vertical inflow between the Brazos River Alluvium Aquifer and overlying or underlying units.

3.5.3. Woodbine Aquifer

The estimated annual volume of flow into the District for the Woodbine Aquifer is 223 acre-feet. The estimated annual volume of flow out of the District for the Woodbine Aquifer is 8 acre-feet. The estimate of the annual volume of flow between from the Washita and Fredericksburg series to the Woodbine Aquifer is 71 acre-feet (Appendix 10.2).

3.6. *Estimate of the Projected Surface Water Supply Within the District According To the Most Recently Adopted 2011 State Water Plan, 31 TAC §356.5(a)(5)(F); TWC §36.1071(e)(3)(F)*

The projected surface water supply for McLennan County ranges from 80,690 acre-feet in 2010 to 81,451 acre-feet in 2060 (see Appendix 10.11).

3.7. *Estimate of the Projected Total Demand for Water Within the District According to the 2011 State Water Plan 31 TAC §356.5(a)(5)(G); TWC §36.1071(e)(3)(G)*

The 2012 State Water Plan lists the water demands within the District as 58,631 acre-feet in 2010 and increasing to 88,212 acre-feet in 2060 (Appendix 10.11).

4. Performance Standards and Management Objectives For Effecting the Plan 31 TAC §356.5(a)(2)&(3); TWC §36.1071(e)(1)

The District will prepare and present an annual report to the Board of Directors on the performance of the District in regards to achieving management goals and objectives. The Board will maintain the adopted report on file, for public inspection, at the District's offices. This methodology will apply to all management goals contained within this plan.

5. Actions, Procedures, Performance and Avoidance Necessary To Effectuate The Management Plan 31 TAC §356.5(A)(4); TWC §36.1071(E)(2) and §36.108(d)

The District's rules relating to permitting, well spacing, production limits, and transportation of groundwater outside of the District will be developed consistent with this plan and in consideration of the best technical data that are reasonable available regarding the groundwater resources within the District.

The District will seek cooperation with other agencies in the implementation of this plan and the management of groundwater supplies within the District. Activities of the District will be undertaken in cooperation and coordination with the appropriate state, regional or local water management entity.

5.1. Socioeconomic Impacts

The TWDB has prepared reports on the socioeconomic impacts of not meeting the water needs identified for each of the Regional Water Planning Groups for the 2011 Regional Water Plans as adopted in the 2012 State of Texas Water Plan. The District has evaluated the development of its DFCs in the context of the recommended water management strategies proposed in the 2011 Regional Water Plan.

5.2. Interests and Rights in Private Property

The District has considered the potential impact on private property, including the ownership and rights of landowners and their lessees and assigns in groundwater within the GMA as recognized under Texas Water Code Section 36.002.

5.3. Feasibility of Achieving the Desired Future Condition

The District monitors groundwater level conditions in aquifers within the District's boundaries, accurately obtains and measures the amount of groundwater production, and is currently meeting its "district averaged" desired future conditions

6. Evidence of Coordination and Adoption of Plan

6.1. Certified Copy of The District's Resolution Adopting The Plan 31 TAC §356.6(a)(2)

Appendix 10.13 contains a copy of the District resolution adopting this plan.

6.2. Evidence That The Plan Was Adopted After Notice and Hearing 31 TAC §356.6(a)(5)

Documentation demonstrating that the plan was adopted after appropriate public notice and hearing are located at Appendix 10.14 - Evidence of Notice and Hearing.

6.3. Coordination of Management Plan With Surface Water Management Entities 31 TAC §356.6(a)(4); TWC §36.1071(a)

The District provided a draft of its proposed Management Plan to the surface water management entities within its boundaries and invited comments from those entities. Copies of the letters transmitting the draft are located in Appendix 10.15.

6.4. Copy of District's Current Rules 31 TAC §356.6(a)(3)

A hard copy of the District's current, existing rules are included at Appendix 10.12.

7. Consideration of State Water Plan Water Supply Needs and Water Management Strategies 31 TAC §356.5(a)(7); TWC §36.1071(e)(4)

7.1. Water Supply Needs

Appendix 10.11 contains a list the Water Supply Needs adopted in the 2012 State Water Plan for McLennan County showing a supply need (deficit) of 245 acre-feet per year in 2010 and 1,745 acre-feet per year in 2060.

7.2. Water Management Strategies

Appendix 10.11 contains a list the Project Water Management Strategies adopted in the 2012 State Water Plan for Region G lists 6 general water management strategies. All of these strategies were reviewed and considered in the development of this plan.

8. Management Goals, 31TAC §356.5(a)(6)

For each of the following management goals, except to the extent that a goal is not applicable or not cost-effective, the District has identified specific objectives and listed performance standards to assess the progress of those objectives. The Board will evaluate the District's progress for attaining its management goals by periodically reviewing the performance standards and possibly modifying the management plan.

8.1. Providing the Most Efficient Use of Groundwater 31 TAC 356.5(a)(1)(A); TWC §36.1071(a)(1)

In order to meet this goal, the District has established the following Management Objectives:

1. The District will establish a District Aquifer Water Level Observation Well Program with one or more observation well located within the portions of the Trinity and Brazos River Alluvium aquifers within the District, and measure the depth to groundwater in each well or wells at least once annually.
2. The District will provide educational leadership to citizens within the District concerning efficient use of groundwater. The activity will be accomplished annually through at least one printed publication, such as a brochure, and one public presentation at service organizations and/or public schools.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standards:

1. Establish a District Aquifer Water Level Observation Well Program and its criteria, and begin measurements of the observation wells within one year following the adoption and approval of this plan.
2. Water levels at these observation well or wells will be measured a minimum of once annually.

3. The number of publications and speaking appearances by the District each year will be included in an annual report to the Board.

8.2. *Controlling and Preventing Waste of Groundwater 31 TAC 356.5(a)(1)(B); TWC §36.1071(a)(2)*

In order to meet this goal, the District has established the following Management Objectives:

1. The District will provide educational leadership to citizens within the District identifying ways to minimize and avoid the waste of groundwater. This will be accomplished annually through at least one printed or on-line publication, such as a brochure, and one public presentation at service organizations and/or public schools.
2. The District will implement a Well Closure Program. The objective of the well closure program is to obtain the closure and plugging of derelict and abandoned wells in a manner that is consistent with state law, for the protection of the aquifers, the environment, and the public safety. The District will conduct a program to identify, inspect, categorize and cause abandoned and derelict wells to be closed and plugged.

In order to assess the progress of the objective listed above, the District has designated the following Performance Standard:

1. The number of publications and speaking appearances by the District each year will be included in the annual report to the Board.
2. When applicable, the annual funding for the District's Well Closure Program, and the number of wells closed and plugged as a result of the Well Closure Program will be included in the annual report to the Board.

8.3. *Controlling and Preventing Subsidence, 31 TAC 356.5(a)(1)(C); TWC §36.1071(a)(3)*

This management goal is not applicable to the District. Because subsidence is not likely to affect the District, the District has not established any Management Objectives or Performance Standards for this conservation goal. Subsidence is unlikely to occur in the District. The geologic formations in the District range in age from Cretaceous (sandstones, limestones and shales of the Hosston, Hensell, Paluxy and Woodbine formations) to Quaternary (floodplain deposits of the Brazos River Alluvium). The Cretaceous formations are generally consolidated to semi-consolidated, and have little potential for compaction and subsidence due to groundwater withdrawals. The Brazos River Alluvium is poorly consolidated, but generally too thin to experience measurable (if any) subsidence due to groundwater withdrawals.

8.4. Addressing Conjunctive Surface Water Management Issues 31 TAC 356.5(a)(1)(D); TWC §36.1071(a)(4)

In order to meet this goal, the District has established the following Management Objective:

Each year the District will confer at least once with the Brazos River Authority (BRA) and the cities of Crawford, Mart, Robinson, and Waco on cooperative opportunities for conjunctive resource management.

In order to assess the progress of the objective listed above, the District has designated the following Performance Standard:

The number of conferences with the BRA and the cities of Crawford, Mart, Robinson and Waco on conjunctive resource management each year will be included in the annual report to the Board.

8.5. Addressing Natural Resource Issues that Impact the Use and Availability of Groundwater and Which are Impacted by the Use of Groundwater 31 TAC 356.5(a)(1)(E); TWC §36.1071(a)(5)

In order to meet this goal, the District has established the following Management Objectives:

1. Each year the District will contact at least once with a representative of the Texas Railroad Commission (RRC) to confer on the impact of oil and gas production on groundwater availability and quality, as well as the impact of groundwater production on the production of oil and gas in the District.
2. Also, during each year the District will evaluate permit applications for new wells, if any are filed, and the information submitted by the applicants on those wells prior to drilling, in order to assess the impact of these wells on the groundwater resources in the District.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standards:

1. The number of conferences with a representative of the RRC each year will be included in an annual report to the Board.
2. Annual reports to the District's Board of Directors on the number of new well permit applications on file, the number of evaluations and the possible impacts of those new wells on the groundwater resources in the District.

8.6. Addressing Drought Conditions 31 TAC 356.5(a)(1)(F); TWC §36.1071(a)(6)

In order to meet this goal, the District has established the following Management Objective:

The District will track rainfall records from nearby weather stations on an on going basis. This data will be compared to hydrographs in monitoring wells used by the District. Additionally, the District will monitor the updated Palmer Drought Severity Index (PDSI) map by downloading at least one map monthly and check for periodic updates to the Drought Preparedness Council

Situation Report posted on the Texas Department of Public Safety web site and the Agricultural Drought Task Force hosted by the Texas Agrilife Extension. The District staff will provide in its annual report in January the precipitation amounts, water levels and any apparent associated trends. Upon Board approval, the District's web site and/or local newspapers will disseminate information to the public.

In order to assess the progress of the objective listed above, the District has designated the following Performance Standards:

Report on precipitation amounts as compared to water levels within the District; and, manner and timing of distribution of precipitation and water level data to the public.

8.7. *Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, or Brush Control, where Appropriate and Cost Effective 31 TAC 356.5(a)(1)(G); TWC §36.1071(a)(7)*

In order to meet this goal, the District has established the following Management Objective:

The District will provide educational leadership to citizens within the District concerning groundwater conservation, rainwater harvesting, and brush control. The educational efforts will be through at least one printed publication, such as a brochure, and at least one public speaking program at a service organization and/or public school. Each of the following topics will be addressed:

A. Conservation of groundwater

The District will provide educational leadership to citizens within the District concerning groundwater conservation,. The educational efforts will be through at least one printed publication, such as a brochure, annually and at least one public speaking program at a service organization and/or public school annually.

B. Rainwater Harvesting

The District will provide educational leadership to citizens within the District concerning, rainwater harvesting. The educational efforts will be through at least one printed publication, such as a brochure, annually and at least one public speaking program at a service organization and/or public school annually.

C. Brush Control

The District will provide educational leadership to citizens within the District concerning brush control. The educational efforts will be through at least one printed publication, such as a brochure, annually and at least one public speaking program at a service organization and/or public school annually.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

The number of brochures issued and the number of public speaking programs regarding water conservation, rainwater harvesting, and brush control will be included in the annual report to the District's Board.

8.7.1. Recharge Enhancement

The District has opted to not include in this plan any management objectives related to recharge enhancement because the District does not consider these measures to be appropriate or cost effective for the District. Therefore, this goal is not applicable to the District at this time.

8.7.2. Precipitation Enhancement

The District has opted to not include in this plan any management objectives related to precipitation enhancement because the District does not consider these measures to be appropriate or cost effective for the District. Therefore, this goal is not applicable to the District at this time.

8.8. *Addressing, in a Quantitative Manner, the Desired Future Condition of the Groundwater Resources in the District, 31 TAC 356.5(a)(1)(H); TWC §36.1071(a)(8)*

Groundwater Management Area 8 has established Desired Future Conditions (DFCs) for all aquifers within the District. Pursuant to those DFCs, the Texas Water Development Board has established the Modeled Available Groundwater within the Southern Trinity Groundwater Conservation District for the Trinity, Woodbine, and Brazos River Alluvium aquifers (Appendices 10.5, 10.6, and 10.7).

8.8.1. Trinity Aquifer (Paluxy, Glen Rose, Hensell, Pearsall/Cow Creek/Hammett, Sligo, and Hosston Formations)

Currently there is no significant use of water from the Paluxy or Glen Rose formations in McLennan County. Groundwater wells in the Trinity Aquifer are completed in a variety of ways and may be open, perforated, or screened in both the Hensell and Hosston formations. Therefore, the District manages them as a single aquifer. The average DFC of these two formations is 508 feet of draw down per 50 years or 10.16 feet of draw down per year. The District will limit the total amount of groundwater produced or withdrawn from the portion of the Trinity Aquifer within the District as necessary to limit the draw down in such aquifer to less than 508 feet in the year 2050.

In order to meet this goal, the District has established the following Management Objective:

The District will measure the water level in one or more wells open, perforated, or screened in the portion of the Paluxy, Glen Rose, Hensell and/or Hosston formations within the District and shall calculate the annual and cumulative draw down and provide such information to the District's Board of Directors.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

The District will provide an analysis report of the effects from pumping on groundwater levels, including the annual and cumulative draw down statistics, in the annual report to the District Board of Directors.

8.8.2. Woodbine Aquifer

The Woodbine Aquifer is a minor aquifer that extends only into a very small portion of the northernmost part of the McLennan County. The outcrop of the Woodbine occurs within the District boundaries but is covered by alluvium over much of its area. There is no or very little use of the groundwater in the portion of the Woodbine Aquifer within McLennan County and currently the District is not aware of any well that is operational in the portion of the Woodbine Aquifer that is located within the District. The average DFC for the Woodbine formation is 61 feet of drawdown per 50 years or 0.8 feet of drawdown per year. The District will limit the total amount of the groundwater produced or withdrawn from the Woodbine Aquifer as necessary to meet the DFCs.

In order to meet this goal, the District has established the following Management Objective:

The District will locate a well screened in the Woodbine Aquifer and will annually collect the water level in one or more wells open, perforated or screened in the Woodbine Aquifer, and shall calculate the annual and cumulative draw down and provide such information to the District's Board of Directors.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

The District will provide an analysis report of the effects from pumping on groundwater levels, including the annual and cumulative draw down statistics in the annual report to the District's Board of Directors.

8.8.3. Brazos River Alluvium Aquifer

The average DFC of the Brazos River Alluvium Aquifer is to maintain 82% of estimated saturated thickness after 50 years in McLennan County. The District will limit the total amount of groundwater produced or withdrawn from the portion of the Brazos River Alluvium Aquifer as necessary to meet the DFCs.

In order to meet this goal, the District has established the following Management Objective:

The District will annually measure the water level in one or more wells open, perforated, or screened in the portion of the Brazos River Alluvium within the District and shall calculate the annual and cumulative draw down and provide such information to the District's Board of Directors.

In order to assess the progress of the objectives listed above, the District has designated the following Performance Standard:

The District will provide an analysis report of the effects from pumping on groundwater levels, including the annual and cumulative draw down statistics, in the annual report to the District's Board of Directors.

9. References

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